

CLAIMS

What is claimed is:

- 1 1. A fibrous assembly comprising:
2 a first fiber that sequesters a first reactive component; and
3 a second fiber that sequesters a second reactive component,
4 wherein at least the first or second fiber releases its reactive component when the
5 fiber is in the presence of a releasing agent, and
6 wherein when the at least first or second fiber releases its reactive component, the
7 first and second reactive components react with each other to form a reaction
8 product.
- 1 2. The fibrous assembly of claim 1, wherein at least the first or second fiber is
2 polymeric.
- 1 3. The fibrous assembly of claim 1, wherein at least the first or second fiber is a
2 nanofiber.
- 1 4. The fibrous assembly of claim 1, wherein at least the first or second fiber is a
2 nanofiber prepared by an electrospinning or gas-jet method.
- 1 5. The fibrous assembly of claim 1, wherein at least the first or second reactive
2 component is a particle, a dissolved molecule, a fibrous skeleton that was created by
3 electrospinning, a uniform coating, a ribbon, a tube, a gas-filled pore, a fluid-filled
4 pore, or bound to an ion-exchange-resin bead.
- 1 6. The fibrous assembly of claim 1, wherein the reaction product of the first reactive
2 component and the second reactive component is nitric oxide.
- 1 7. The fibrous assembly of claim 1, wherein the first reactive component is a
2 carboxylic acid and the second reactive component is nitrite.

- 1 8. The fibrous assembly of claim 1, wherein the first reactive component is a urethane
2 prepolymer and the second reactive component is a diamine or diol.
- 1 9. The fibrous assembly of claim 1, wherein at least the first or second reactive
2 component is bound to an ion-exchange-resin bead.
- 1 10. The fibrous assembly of claim 1, wherein the releasing agent is a solvent, a signaling
2 substance, radiation, heat, a mechanical force, a charged particle, an electron, a
3 magnetic particle, a magnetic field, forces from a flowing fluid, hydrostatic pressure,
4 mechanical deformation, or a combination thereof.
- 1 11. The fibrous assembly of claim 1, wherein the releasing agent is a solvent.
- 1 12. The fibrous assembly of claim 1, wherein at least the first or second fiber dissolves
2 or swells in the presence of the releasing agent.
- 1 13. The fibrous assembly of claim 5, wherein the fluid is a wax, oil, oligomer-containing
2 fluid, low-molecular-weight liquid, or combination thereof.
- 1 14. The fibrous assembly of claim 7, wherein the carboxylic acid is ascorbic acid.
- 1 15. A method for preparing a fibrous assembly comprising the steps:
2 preparing a first fiber that sequesters a first reactive component;
3 preparing a second fiber that sequesters a second reactive component; and
4 incorporating the first and second fiber into a fibrous assembly,
5 wherein at least the first or second fiber releases its sequestered reactive component
6 when that fiber is exposed to a releasing agent, and
7 wherein when at least the first or second sequestered reactive component is released
8 from its respective fiber, the first and second reactive components react with each
9 other to form a reaction product.

- 1 16. The method of claim 15, wherein the step of preparing a first fiber or the step of
2 preparing a second fiber is performed by using at least an electrospinning or gas-jet
3 method.
- 1 17. The method of claim 15, wherein the first fiber is prepared by electrospinning a first
2 electrospinnable solution having a first polymer and a first reactive component; and
3 the second fiber is prepared by electrospinning a second electrospinnable
4 solution having a second polymer and a second reactive component,
5 wherein the second reactive component is reactable with the first reactive
6 component.
- 1 18. The method of claim 15, wherein a reaction product of the first reactive component
2 and the second reactive component is nitric oxide.
- 1 19. The method of claim 15, wherein the first reactive component is a carboxylic acid
2 and the second reactive component is nitrite.
- 1 20. The method of claim 15, wherein the first reactive component is a urethane
2 prepolymer and the second reactive component is a diamine or diol.
- 1 21. The method of claim 15, wherein at least the first or second reactive component is
2 bound to an ion-exchange-resin bead.
- 1 22. The method of claim 15, wherein at least the first or second reactive component is a
2 particle, a dissolved molecule, a fibrous skeleton that was created by electrospinning,
3 a uniform coating, a ribbon, a tube, a gas-filled pore, a fluid-filled pore, or bound to
4 an ion-exchange-resin bead.
- 1 23. The method of claim 17, wherein electrospinning the first electrospinnable solution
2 results in a first fiber that sequesters the first reactive component, and wherein

3 electrospinning the second electrospinnable solution results in a second fiber that
4 sequesters the second reactive component.

1 24. The method of claim 19, wherein the carboxylic acid is ascorbic acid.

1 25. The method of claim 22, wherein the fluid is a wax, oil, oligomer-containing fluid,
2 low-molecular-weight liquid, or combination thereof.

1 26. A medical-treatment method comprising the step:
2 treating a patient with a fibrous assembly, wherein the fibrous assembly has
3 a first fiber that sequesters a first reactive component; and
4 a second fiber that sequesters a second reactive component,
5 wherein at least the first or second fiber releases its reactive component when that
6 fiber is exposed to a releasing agent, and
7 wherein when at least the first or second reactive component is released from its
8 respective fiber, the first and second reactive components react to form a reaction
9 product.

1 27. The method of claim 26, wherein a reaction product of the first reactive component
2 and the second reactive component is nitric oxide.

1 28. The method of claim 26, wherein the first reactive component is a carboxylic acid
2 and the second reactive component is nitrite.

1 29. The method of claim 26, wherein the releasing agent is a solvent, a signaling
2 substance, radiation, heat, a mechanical force, a charged particle, an electron, a
3 magnetic particle, a magnetic field, forces from a flowing fluid, hydrostatic pressure,
4 mechanical deformation, or a combination thereof.

1 30. The method of claim 26, wherein at least the first or second fiber is a nanofiber.

- 1 31. The method of claim 26, wherein at least the first or second fiber is a nanofiber
2 prepared by an electrospinning or gas-jet method.
- 1 32. The method of claim 28, wherein the carboxylic acid is ascorbic acid.
- 1 33. A method for creating an epoxy-type adhesive comprising the step:
2 adding a releasing agent to a fibrous assembly having a first fiber that
3 sequesters a urethane prepolymer and second fiber that sequesters a diamine,
4 wherein at least the urethane prepolymer or the diamine is released from its fiber
5 when that fiber is in the presence of the releasing agent, and
6 wherein when at least the urethane prepolymer or the diamine is released from its
7 respective fiber, the urethane prepolymer and diamine react with each other to form
8 an epoxy-type adhesive.
- 1 34. The method of claim 33, wherein the releasing agent is water.
- 1 35. A fibrous assembly comprising:
2 a first fiber that sequesters a first reactive component,
3 wherein when the first reactive component is in the presence of a releasing agent, the
4 first reactive component reacts with the releasing agent to produce a reaction
5 product.
- 1 36. The fibrous assembly of claim 35, wherein the first fiber is polymeric.
- 1 37. The fibrous assembly of claim 35, wherein the first fiber is a nanofiber.
- 1 38. The fibrous assembly of claim 35, wherein the first fiber is a nanofiber prepared by
2 an electrospinning or gas-jet method.
- 1 39. The fibrous assembly of claim 35, wherein at least the first reactive component is a
2 particle, a dissolved molecule, a fibrous skeleton that was created by electrospinning,

- 3 a uniform coating, a ribbon, a tube, a gas-filled pore, a fluid-filled pore, or bound to
4 an ion-exchange-resin bead.
- 1 40. The fibrous assembly of claim 35, wherein the reaction product of the first reactive
2 component and the releasing agent is nitric oxide.
- 1 41. The fibrous assembly of claim 35, wherein the first reactive component is a
2 carboxylic acid or nitrite.
- 1 42. The fibrous assembly of claim 35, wherein the first reactive component is a urethane
2 prepolymer, a diamine, or a diol.
- 1 43. The fibrous assembly of claim 35, wherein at least the first reactive component is
2 bound to an ion-exchange-resin bead.
- 1 44. The fibrous assembly of claim 35, wherein the releasing agent is a solvent, a
2 signaling substance, radiation, heat, a mechanical force, a charged particle, an
3 electron, a magnetic particle, a magnetic field, forces from a flowing fluid,
4 hydrostatic pressure, mechanical deformation, or a combination thereof.
- 1 45. The fibrous assembly of claim 35, wherein the releasing agent is a solvent.
- 1 46. The fibrous assembly of claim 35, wherein the first fiber dissolves or swells in the
2 presence of the releasing agent.
- 1 47. The fibrous assembly of claim 39, wherein the fluid is a wax, oil, oligomer-
2 containing fluid, low-molecular-weight liquid, or combination thereof.
- 1 48. The fibrous assembly of claim 41, wherein the carboxylic acid is ascorbic acid.